OM-216 655G 2009−06

Effective with serial number: 250 950

Processes

MIG (GMAW) Welding

Flux Cored (FCAW) Welding

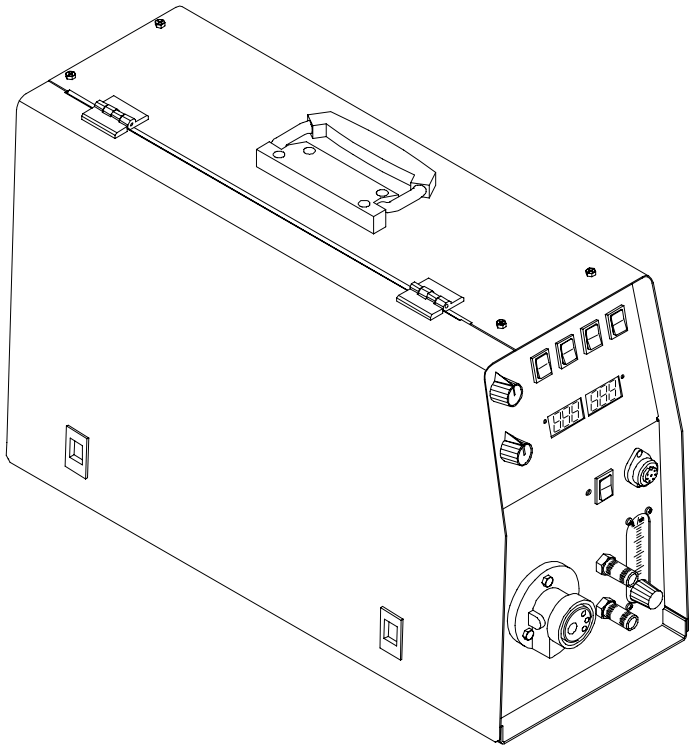
Description

CV

Wire Feeder

ST 44 Series Wire Feeder

CE



www.MillerWelds.com

OWNER'S MANUAL

From Miller to You

Thank you and *congratulations* on choosing Miller. Now you can get the job done and get it done right. We know you don't have time to do it any other way.

That's why when Niels Miller first started building arc welders in 1929, he made sure his products offered long-lasting value and superior quality. Like you, his customers couldn't afford anything less. Miller products had to be more than the best they could be. They had to be the best you could buy.

Today, the people that build and sell Miller products continue the tradition. They're just as committed to providing equipment and service that meets the high standards of quality and value established in 1929.

This Owner's Manual is designed to help you get the most out of your Miller products. Please take time to read the Safety precautions. They will help you protect yourself against potential hazards on the worksite. We've made installation and operation quick and easy. With Miller you can count on years of reliable service with proper maintenance. And if for some reason the unit needs repair, there's a Troubleshooting section that will help you figure out what the problem is. The parts list will then help you to decide which exact part you may need to fix the problem. Warranty and service information for your particular model are also provided.

Miller Electric manufactures a full line of welders and welding related equipment. For information on other quality Miller products, contact your local Miller distributor to receive the latest full line catalog or individual catalog sheets.

TRUE BLUE® WARRANTY

Working as hard as you do − every power source from Miller is backed by the most hassle-free warranty in the business.

Miller®

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WARRANTY

DECLARATION OF CONFORMITY

for European Community (CE marked) products.

ITW Welding Products Italy S.r.l. Via Privata Iseo 6/E, 20098 San Giuliano M.se, (MI) Italy declare that the product(s) identified in this declaration conform to the essential requirements and provisions of the stated Council Directive(s) and Standard(s).

Product/Apparatus Identification:

Product	Stock Number
ST 44 Basic	029 007 406
ST 44 c/w Digital A/V/WFS, Water Kit & RVC	029 007 404

Council Directives:

2006/95/EC Low Voltage

2004/108/EC Electromagnetic Compatibility

2006/42/EEC Machinery Directive

Standards:

IEC 60974-1 Arc Welding Equipment Welding Power Sources: edition 3.0 2005-07.

IEC 60974-5 Arc Welding Equipment Wire Feeders: edition 2.0, 2007-11.

IEC 60974-10 Arc Welding Equipment Electromagnetic Compatibility Requirements: edition 2.0, 2007-08

EU Signatory:

May 10, 2009

Mark Lowther

European Director, Technology & Product Development.

Date of Declaration

SECTION 1 − SAFETY PRECAUTIONS - READ BEFORE USING

Protect yourself and others from injury — read and follow these precautions.

1-1. Symbol Usage

DANGER! − Indicates a hazardous situation which, if not avoided, will result in death or serious injury. The possible hazards are shown in the adjoining symbols or explained in the text.

Indicates a hazardous situation which, if not avoided, could result in death or serious injury. The possible hazards are shown in the adjoining symbols or explained in the text.

NOTICE *− Indicates statements not related to personal injury.*

☞ *Indicates special instructions.*

This group of symbols means Warning! Watch Out! ELECTRIC SHOCK, MOVING PARTS, and HOT PARTS hazards. Consult symbols and related instructions below for necessary actions to avoid the hazards.

1-2. Arc Welding Hazards

The symbols shown below are used throughout this manual to call attention to and identify possible hazards. When you see the symbol, watch out, and follow the related instructions to avoid the hazard. The safety information given below is only a summary of the more complete safety information found in the Safety Standards listed in Section 1-5. Read and follow all Safety Standards.

Only qualified persons should install, operate, maintain, and repair this unit.

During operation, keep everybody, especially children, away.

ELECTRIC SHOCK can kill.

Touching live electrical parts can cause fatal shocks or severe burns. The electrode and work circuit is electrically live whenever the output is on. The input power circuit and machine internal circuits are also live when power is on. In semiautomatic or automatic wire welding, the wire, wire reel, drive roll housing, and all metal parts touching the welding wire are electrically live. Incorrectly installed or improperly grounded equipment is a hazard.

- Do not touch live electrical parts.
- Wear dry, hole-free insulating gloves and body protection.
- Insulate yourself from work and ground using dry insulating mats or covers big enough to prevent any physical contact with the work or ground.
- Do not use AC output in damp areas, if movement is confined, or if there is a danger of falling.
- Use AC output ONLY if required for the welding process.
- If AC output is required, use remote output control if present on unit.
- Additional safety precautions are required when any of the following electrically hazardous conditions are present: in damp locations or while wearing wet clothing; on metal structures such as floors, gratings, or scaffolds; when in cramped positions such as sitting, kneeling, or lying; or when there is a high risk of unavoidable or accidental contact with the workpiece or ground. For these conditions, use the following equipment in order presented: 1) a semiautomatic DC constant voltage (wire) welder, 2) a DC manual (stick) welder, or 3) an AC welder with reduced open-circuit voltage. In most situations, use of a DC, constant voltage wire welder is recommended. And, do not work alone!
- Disconnect input power or stop engine before installing or servicing this equipment. Lockout/tagout input power according to OSHA 29 CFR 1910.147 (see Safety Standards).
- Properly install and ground this equipment according to its Owner's Manual and national, state, and local codes.
- Always verify the supply ground − check and be sure that input power cord ground wire is properly connected to ground terminal in disconnect box or that cord plug is connected to a properly grounded receptacle outlet.
- When making input connections, attach proper grounding conductor first − double-check connections.
- Keep cords dry, free of oil and grease, and protected from hot metal and sparks.
- Frequently inspect input power cord for damage or bare wiring − replace cord immediately if damaged − bare wiring can kill.
- Turn off all equipment when not in use.
- Do not use worn, damaged, undersized, or poorly spliced cables.
- Do not drape cables over your body.
- If earth grounding of the workpiece is required, ground it directly with a separate cable.
- Do not touch electrode if you are in contact with the work, ground, or another electrode from a different machine.
- Do not touch electrode holders connected to two welding machines at the same time since double open-circuit voltage will be present.
- Use only well-maintained equipment. Repair or replace damaged parts at once. Maintain unit according to manual.
- Wear a safety harness if working above floor level.
- Keep all panels and covers securely in place.
- Clamp work cable with good metal-to-metal contact to workpiece or worktable as near the weld as practical.
- Insulate work clamp when not connected to workpiece to prevent contact with any metal object.
- Do not connect more than one electrode or work cable to any single weld output terminal.

SIGNIFICANT DC VOLTAGE exists in inverter-type welding power sources after removal of input power.

- Turn Off inverter, disconnect input power, and discharge input capacitors according to instructions in Maintenance Section before touching any parts.

HOT PARTS can cause severe burns.

- Do not touch hot parts bare handed.
- Allow cooling period before working on gun or torch.
- To handle hot parts, use proper tools and/or wear heavy, insulated welding gloves and clothing to prevent burns.

FUMES AND GASES can be hazardous.

Welding produces fumes and gases. Breathing these fumes and gases can be hazardous to your health.

- Keep your head out of the fumes. Do not breathe the fumes.
- If inside, ventilate the area and/or use local forced ventilation at the arc to remove welding fumes and gases.
- If ventilation is poor, wear an approved air-supplied respirator.
- Read and understand the Material Safety Data Sheets (MSDSs) and the manufacturer's instructions for metals, consumables, coatings, cleaners, and degreasers.
- Work in a confined space only if it is well ventilated, or while wearing an air-supplied respirator. Always have a trained watch-person nearby. Welding fumes and gases can displace air and lower the oxygen level causing injury or death. Be sure the breathing air is safe.
- Do not weld in locations near degreasing, cleaning, or spraying operations. The heat and rays of the arc can react with vapors to form highly toxic and irritating gases.
- Do not weld on coated metals, such as galvanized, lead, or cadmium plated steel, unless the coating is removed from the weld area, the area is well ventilated, and while wearing an air-supplied respirator. The coatings and any metals containing these elements can give off toxic fumes if welded.

ARC RAYS can burn eyes and skin.

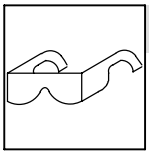
Arc rays from the welding process produce intense visible and invisible (ultraviolet and infrared) rays that can burn eyes and skin. Sparks fly off from the weld.

- Wear an approved welding helmet fitted with a proper shade of filter lenses to protect your face and eyes when welding or watching (see ANSI Z49.1 and Z87.1 listed in Safety Standards).
- Wear approved safety glasses with side shields under your helmet.
- Use protective screens or barriers to protect others from flash, glare and sparks; warn others not to watch the arc.
- Wear protective clothing made from durable, flame-resistant material (leather, heavy cotton, or wool) and foot protection.

WELDING can cause fire or explosion.

Welding on closed containers, such as tanks, drums, or pipes, can cause them to blow up. Sparks can fly off from the welding arc. The flying sparks, hot workpiece, and hot equipment can cause fires and burns. Accidental contact of electrode to metal objects can cause sparks, explosion, overheating, or fire. Check and be sure the area is safe before doing any welding.

- Remove all flammables within 35 ft (10.7 m) of the welding arc. If this is not possible, tightly cover them with approved covers.
- Do not weld where flying sparks can strike flammable material.
- Protect yourself and others from flying sparks and hot metal.
- Be alert that welding sparks and hot materials from welding can easily go through small cracks and openings to adjacent areas.
- Watch for fire, and keep a fire extinguisher nearby.
- Be aware that welding on a ceiling, floor, bulkhead, or partition can cause fire on the hidden side.
- Do not weld on closed containers such as tanks, drums, or pipes, unless they are properly prepared according to AWS F4.1 (see Safety Standards).
- Do not weld where the atmosphere may contain flammable dust, gas, or liquid vapors (such as gasoline).
- Connect work cable to the work as close to the welding area as practical to prevent welding current from traveling long, possibly unknown paths and causing electric shock, sparks, and fire hazards.
- Do not use welder to thaw frozen pipes.
- Remove stick electrode from holder or cut off welding wire at contact tip when not in use.
- Wear oil-free protective garments such as leather gloves, heavy shirt, cuffless trousers, high shoes, and a cap.
- Remove any combustibles, such as a butane lighter or matches, from your person before doing any welding.
- After completion of work, inspect area to ensure it is free of sparks, glowing embers, and flames.
- Use only correct fuses or circuit breakers. Do not oversize or bypass them.
- Follow requirements in OSHA 1910.252 (a) (2) (iv) and NFPA 51B for hot work and have a fire watcher and extinguisher nearby.



FLYING METAL or DIRT can injure eyes.

- Welding, chipping, wire brushing, and grinding cause sparks and flying metal. As welds cool, they can throw off slag.
- Wear approved safety glasses with side shields even under your welding helmet.

BUILDUP OF GAS can injure or kill.

- Shut off shielding gas supply when not in use.
- Always ventilate confined spaces or use approved air-supplied respirator.

MAGNETIC FIELDS can affect Implanted Medical Devices.

- Wearers of Pacemakers and other Implanted Medical Devices should keep away.
- Implanted Medical Device wearers should consult their doctor and the device manufacturer before going near arc welding, spot welding, gouging, plasma arc cutting, or induction heating operations.

NOISE can damage hearing.

Noise from some processes or equipment can damage hearing.

- Wear approved ear protection if noise level is high.

CYLINDERS can explode if damaged.

Shielding gas cylinders contain gas under high pressure. If damaged, a cylinder can explode. Since gas cylinders are normally part of the welding process, be sure to treat them carefully.

- Protect compressed gas cylinders from excessive heat, mechanical shocks, physical damage, slag, open flames, sparks, and arcs.
- Install cylinders in an upright position by securing to a stationary support or cylinder rack to prevent falling or tipping.
- Keep cylinders away from any welding or other electrical circuits.
- Never drape a welding torch over a gas cylinder.
- Never allow a welding electrode to touch any cylinder.
- Never weld on a pressurized cylinder − explosion will result.
- Use only correct shielding gas cylinders, regulators, hoses, and fittings designed for the specific application; maintain them and associated parts in good condition.
- Turn face away from valve outlet when opening cylinder valve.
- Keep protective cap in place over valve except when cylinder is in use or connected for use.
- Use the right equipment, correct procedures, and sufficient number of persons to lift and move cylinders.
- Read and follow instructions on compressed gas cylinders, associated equipment, and Compressed Gas Association (CGA) publication P-1 listed in Safety Standards.

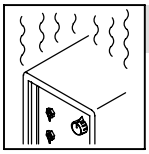
1-3. Additional Symbols For Installation, Operation, And Maintenance

FIRE OR EXPLOSION hazard.

- Do not install or place unit on, over, or near combustible surfaces.
- Do not install unit near flammables.
- Do not overload building wiring − be sure power supply system is properly sized, rated, and protected to handle this unit.

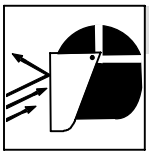
FALLING UNIT can cause injury.

- Use lifting eye to lift unit only, NOT running gear, gas cylinders, or any other accessories.
- Use equipment of adequate capacity to lift and support unit.
- If using lift forks to move unit, be sure forks are long enough to extend beyond opposite side of unit.



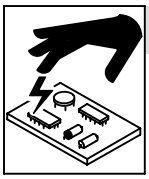
OVERUSE can cause OVERHEATING

- Allow cooling period; follow rated duty cycle.
- Reduce current or reduce duty cycle before starting to weld again.
- Do not block or filter airflow to unit.



FLYING SPARKS can cause injury.

- Wear a face shield to protect eyes and face.
- Shape tungsten electrode only on grinder with proper guards in a safe location wearing proper face, hand, and body protection.
- Sparks can cause fires — keep flammables away.



STATIC (ESD) can damage PC boards.

- Put on grounded wrist strap BEFORE handling boards or parts.
- Use proper static-proof bags and boxes to store, move, or ship PC boards.

MOVING PARTS can cause injury.

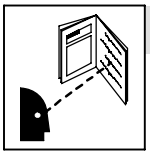
- Keep away from moving parts.
- Keep away from pinch points such as drive rolls.

WELDING WIRE can cause injury.

- Do not press gun trigger until instructed to do so.
- Do not point gun toward any part of the body, other people, or any metal when threading welding wire.

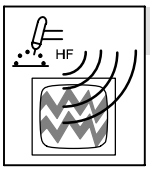
MOVING PARTS can cause injury.

- Keep away from moving parts such as fans.
- Keep all doors, panels, covers, and guards closed and securely in place.
- Have only qualified persons remove doors, panels, covers, or guards for maintenance as necessary.
- Reinstall doors, panels, covers, or guards when maintenance is finished and before reconnecting input power.



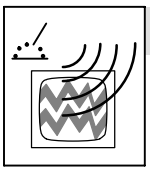
READ INSTRUCTIONS.

- Read Owner's Manual before using or servicing unit.
- Use only genuine replacement parts from the manufacturer.



H.F. RADIATION can cause interference.

- High-frequency (H.F.) can interfere with radio navigation, safety services, computers, and communications equipment.
- Have only qualified persons familiar with electronic equipment perform this installation.
- The user is responsible for having a qualified electrician promptly correct any interference problem resulting from the installation.
- If notified by the FCC about interference, stop using the equipment at once.
- Have the installation regularly checked and maintained.
- Keep high-frequency source doors and panels tightly shut, keep spark gaps at correct setting, and use grounding and shielding to minimize the possibility of interference.



ARC WELDING can cause interference.

- Electromagnetic energy can interfere with sensitive electronic equipment such as computers and computer-driven equipment such as robots.
- Be sure all equipment in the welding area is electromagnetically compatible.
- To reduce possible interference, keep weld cables as short as possible, close together, and down low, such as on the floor.
- Locate welding operation 100 meters from any sensitive electronic equipment.
- Be sure this welding machine is installed and grounded according to this manual.
- If interference still occurs, the user must take extra measures such as moving the welding machine, using shielded cables, using line filters, or shielding the work area.

1-4. California Proposition 65 Warnings

Welding or cutting equipment produces fumes or gases which contain chemicals known to the State of California to cause birth defects and, in some cases, cancer. (California Health & Safety Code Section 25249.5 et seq.)

Battery posts, terminals and related accessories contain lead and lead compounds, chemicals known to the State of California to cause cancer and birth defects or other reproductive harm. Wash hands after handling.

For Gasoline Engines:

Engine exhaust contains chemicals known to the State of California to cause cancer, birth defects, or other reproductive harm.

For Diesel Engines:

Diesel engine exhaust and some of its constituents are known to the State of California to cause cancer, birth defects, and other reproductive harm.

1-5. Principal Safety Standards

Safety in Welding, Cutting, and Allied Processes, ANSI Standard Z49.1, from Global Engineering Documents (phone: 1-877-413-5184, website: www.global.ihs.com).

Recommended Safe Practices for the Preparation for Welding and Cutting of Containers and Piping, American Welding Society Standard AWS F4.1, from Global Engineering Documents (phone: 1-877-413-5184, website: www.global.ihs.com).

National Electrical Code, NFPA Standard 70, from National Fire Protection Association, P.O. Box 9101, Quincy, MA 02269-9101 (phone: 617-770-3000, website: www.nfpa.org and www. sparky.org).

Safe Handling of Compressed Gases in Cylinders, CGA Pamphlet P-1, from Compressed Gas Association, 4221 Walney Road, 5th Floor, Chantilly, VA 20151 (phone: 703-788-2700, website:www.cganet.com).

Code for Safety in Welding and Cutting, CSA Standard W117.2, from Canadian Standards Association, Standards Sales, 5060 Mississauga, Ontario, Canada L4W 5NS (phone: 800-463-6727 or in Toronto 416-747-4044, website: www.csa-international.org).

Safe Practice For Occupational And Educational Eye And Face Protection, ANSI Standard Z87.1, from American National Standards Institute, 25 West 43rd Street, New York, NY 10036–8002 (phone: 212-642-4900, website: www.ansi.org).

Standard for Fire Prevention During Welding, Cutting, and Other Hot Work, NFPA Standard 51B, from National Fire Protection Association, P.O. Box 9101, Quincy, MA 02269-9101 (phone: 617-770-3000, website: www.nfpa.org.

OSHA, Occupational Safety and Health Standards for General Industry, Title 29, Code of Federal Regulations (CFR), Part 1910, Subpart Q, and Part 1926, Subpart J, from U.S. Government Printing Office, Superintendent of Documents, P.O. Box 371954, Pittsburgh, PA 15250-7954 (phone: 1-866-512-1800) (there are 10 Regional Offices—phone for Region 5, Chicago, is 312-353-2220, website: www.osha.gov).

1-6. EMF Information

Considerations About Welding And The Effects Of Low Frequency Electric And Magnetic Fields

Welding current, as it flows through welding cables, will cause electromagnetic fields. There has been and still is some concern about such fields. However, after examining more than 500 studies spanning 17 years of research, a special blue ribbon committee of the National Research Council concluded that: “The body of evidence, in the committee’s judgment, has not demonstrated that exposure to power-frequency electric and magnetic fields is a human-health hazard.” However, studies are still going forth and evidence continues to be examined. Until the final conclusions of the research are reached, you may wish to minimize your exposure to electromagnetic fields when welding or cutting.

To reduce magnetic fields in the workplace, use the following procedures:

1. Keep cables close together by twisting or taping them, or using a cable cover.
2. Arrange cables to one side and away from the operator.
3. Do not coil or drape cables around your body.
4. Keep welding power source and cables as far away from operator as practical.
5. Connect work clamp to workpiece as close to the weld as possible.

About Implanted Medical Devices:

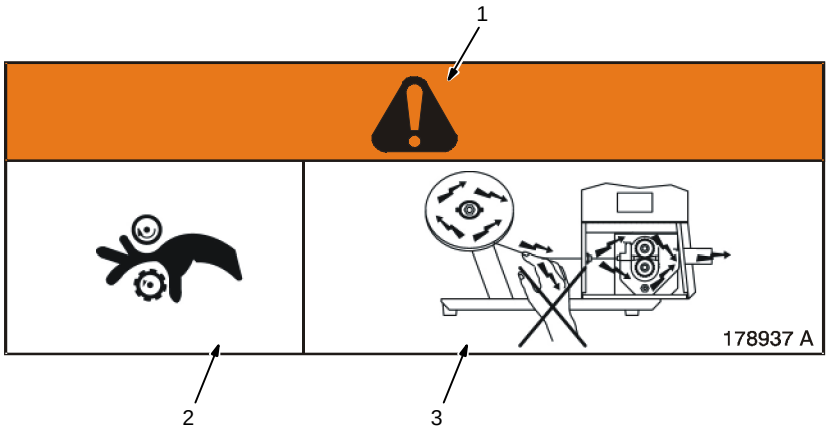
Implanted Medical Device wearers should consult their doctor and the device manufacturer before performing or going near arc welding, spot welding, gouging, plasma arc cutting, or induction heating operations. If cleared by your doctor, then following the above procedures is recommended.

SECTION 2 − DEFINITIONS

2-1. Warning Label Definitions

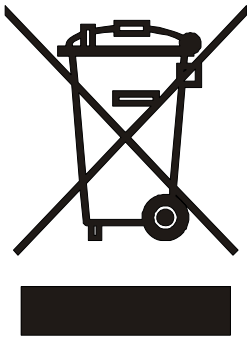
A. Warning! Watch Out! There are possible hazards as shown by the symbols.
B. Drive rolls can injure fingers.
C. Welding wire and drive parts are at welding voltage during operation − keep hands and metal objects clear.
1 Electric shock can kill.
1.1 Wear dry insulating gloves. Do not touch electrode with bare hand. Do not wear wet or damaged gloves.
1.2 Protect yourself from electric shock by insulating yourself from work and ground.
1.3 Disconnect input plug or power before working on machine.
2 Breathing welding fumes can be hazardous to your health.
2.1 Keep your head out of the fumes.
2.2 Use forced ventilation or local exhaust to remove the fumes.
2.3 Use ventilating fan to remove fumes.
3 Welding sparks can cause explosion or fire.
3.1 Keep flammables away from welding. Don't weld near flammables.
3.2 Welding sparks can cause fires. Have a fire extinguisher nearby and have a watch person ready to use it.
3.3 Do not weld on drums or any closed containers.
4 Arc rays can burn eyes and injure skin.
4.1 Wear hat and safety glasses. Use ear protection and button shirt collar. Use welding helmet with correct shade of filter. Wear complete body protection.
5 Become trained and read the instructions before working on the machine or welding.
6 Do not remove or paint over (cover) the label.

2-2. Electric Shock And Pinch Hazard



1 Warning! Watch Out! There are possible hazards as shown by the symbols.
2 Drive rolls can injure fingers
3 Welding wire and drive parts are at welding voltage during operation − keep hands and metal objects away.

2-3. WEEE Symbol (For Products Sold Within The EU)



Do not discard this product with general waste.

Reuse or recycle Waste Electrical and Electronic Equipment (WEEE) by disposing at a designated collection facility.

Contact your local recycling office or your local distributor for further information.

2-4. Symbols and Definitions

☞ *Symbols found on product.*

I	On	O	Off		Input		Output
A	Amperes	V	Volts		Alternating Current	X	Duty Cycle
IP	Degree Of Protection	Hz	Hertz		Circuit Breaker		Wire Feed
	Jog	U_1	Primary Voltage		Gas Metal Arc Welding (GMAW) Gun		Line Connection
	Purge	●●●●t	Spot Weld Time		Spot Weld		Continuous Weld
t	Burnback Time	t_1	Preflow Time	t_2	Postflow Time		Read Instructions
U_2	Load Voltage	I_1	Primary Current	I_2	Rated Current	U_1	Primary Voltage
	Trigger Hold Off		Trigger Hold On		Water (Coolant) Input		Water (Coolant) Output
	Remote		Run−in Control	− +	Gas Flowmeter Adjustment		

SECTION 3 − INSTALLATION

3-1. Serial Number And Rating Label Location

The serial number and rating information for this product is located on back . Use rating label to determine input power requirements and/or rated output. For future reference, write serial number in space provided on back cover of this manual.

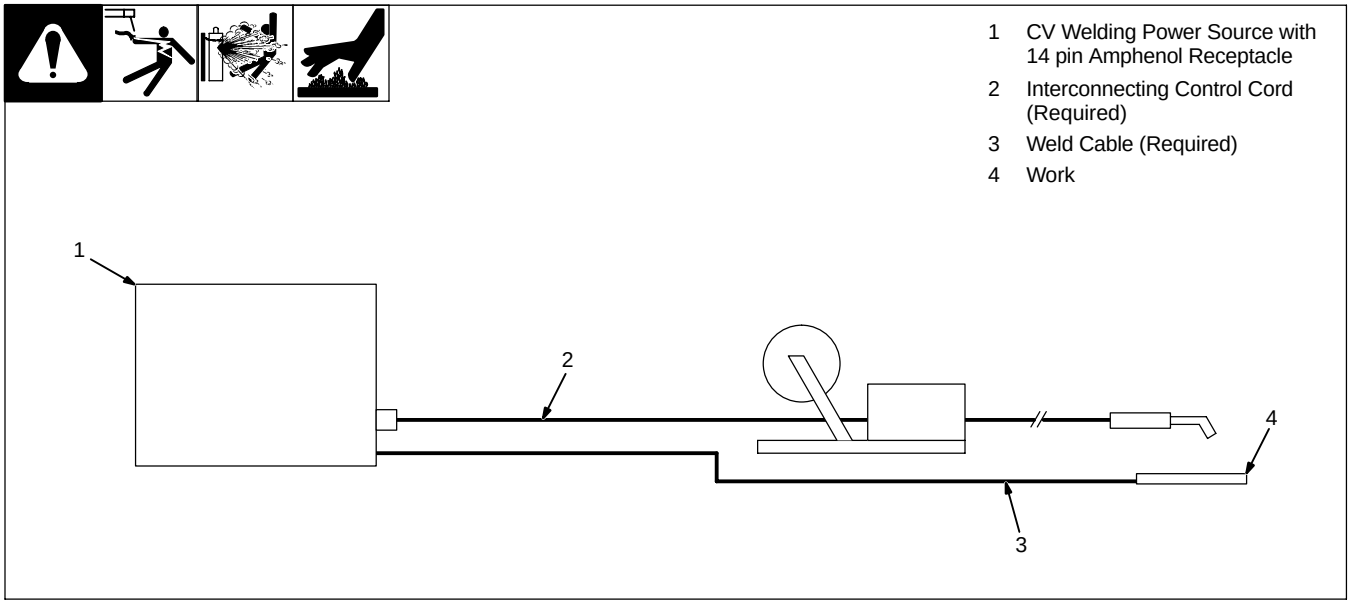
3-2. Specifications

Type of Input Power	Welding Power Source Type	Wire Feed Speed Range	Wire Diameter Range	Welding Circuit Rating	Overall Dimensions	Weight
24 Volts AC Single Phase 5 Amperes 50/60 Hz	Constant Voltage (CV) DC with 14 pin and Contactor Control	0 to 20 mpm (0 to 788 ipm)	0.6 to 2.0 mm (0.23 to 5/64 in) Max Spool Weight: 15 kg (33.0 lb.)	100 Volts, 500 Amperes, 100% Duty Cycle	Length: 650 mm (25.5 in) Width: 220 mm (8.65 in) Height: 420 mm (16.5 in)	ST 44 Series & ST Blu Fab (22.0 kg (48 lbs) ST 44 Ultra-Lite 15.0 kg (33 lbs)

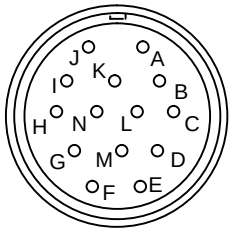
3-3. Gun Recommendation Table

Process	Gun
GMAW − Hard or Cored Wires	Roughneck C-Series Guns: 300, 400, 500, And 600 Amp.
FCAW − Self-Shielding Wires	FC-1260 Or FC-1150

3-4. Equipment Connection Diagrams



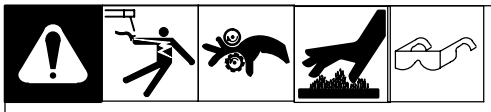
3-5. 14-Pin Plug Information

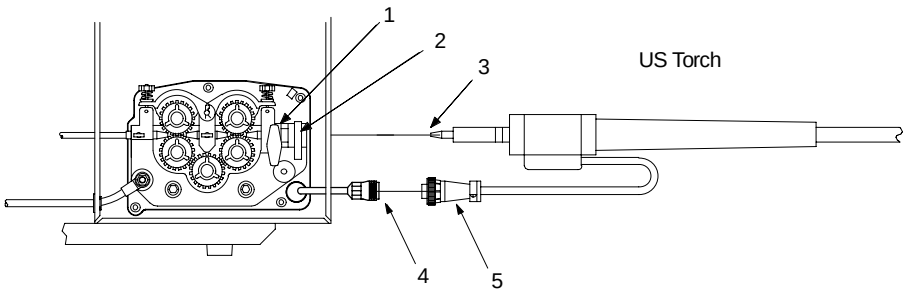
REMOTE 14	Pin*	Pin Information
	A	24 volts AC with respect to pin G.
	B	Contact closure to A completes 24 volts AC contactor control circuit.
	G	Circuit common for 24 volts AC circuit.
	C	+10 volts DC output to remote control with respect to pin D.
	D	Remote control circuit common.
	E	0 to +10 volts DC input command signal from remote control with respect to pin D.
	H	Voltage feedback; 0 to 10 volts DC, 1 V/10 arc volts

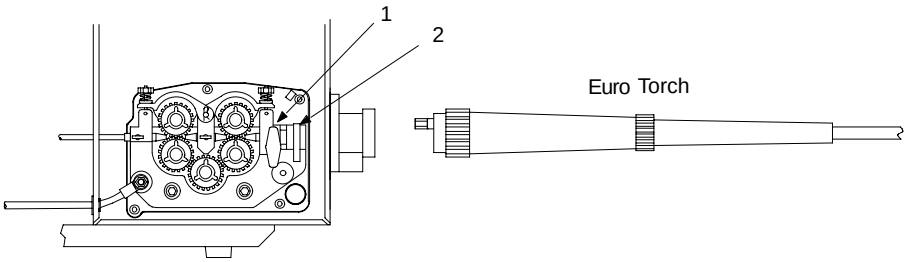
*The remaining pins are not used.

Ref. S-0004-A

3-6. Connecting Welding Gun And Weld Cable







1 Gun Securing Knob

2 Gun Block

3 Gun Outlet Wire Guide

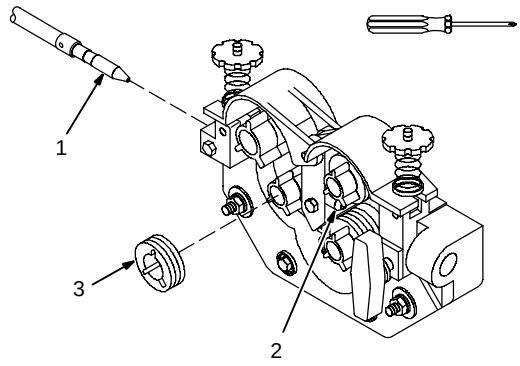
Loosen knob, insert gun into block. Position outlet wire guide as close as possible to drive rolls without touching. Tighten knob.

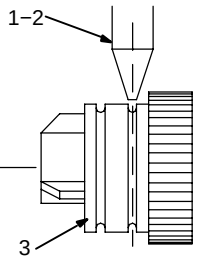
4 Gun Trigger Receptacle

5 Gun Trigger Plug

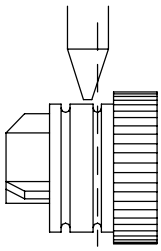
802 308

3-7. Installing Wire Guide And Drive Roll



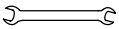


Correct Alignment



Incorrect Alignment

Tools Needed:



3/8 in

1 Inlet Wire Guide

2 Intermediate Wire Guide

Install and secure inlet wire guide, and intermediate wire guide.

3 Drive Roll (4)

Install drive rolls and turn drive roll nut one click.

During maintenance intervals, remove drive rolls, and clean grooves using a wire brush. Check general condition of drive rolls.

Aligning Wire Guide And Drive Rolls:

View is from top of drive rolls looking down with pressure assembly open.

Turn screw in or out until drive roll groove lines up with wire guide.

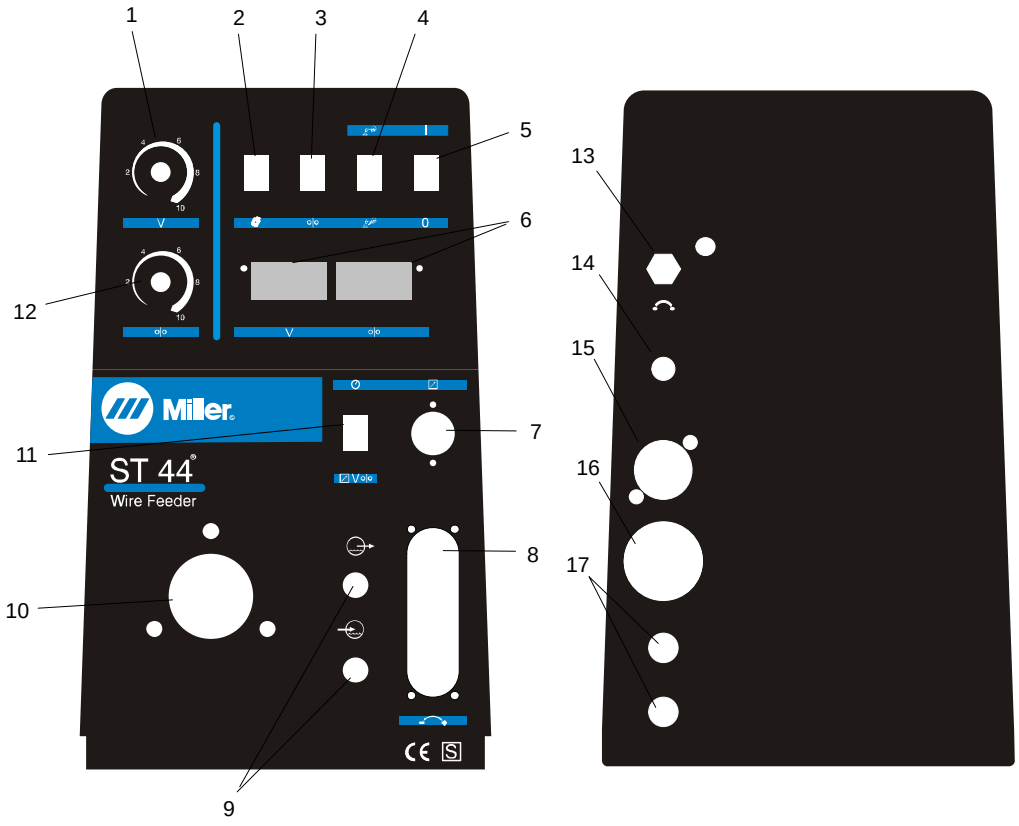
Close pressure roll assembly.

Repeat for remaining drive rolls until all drive rolls line up with wire guides as shown.

802 310-A

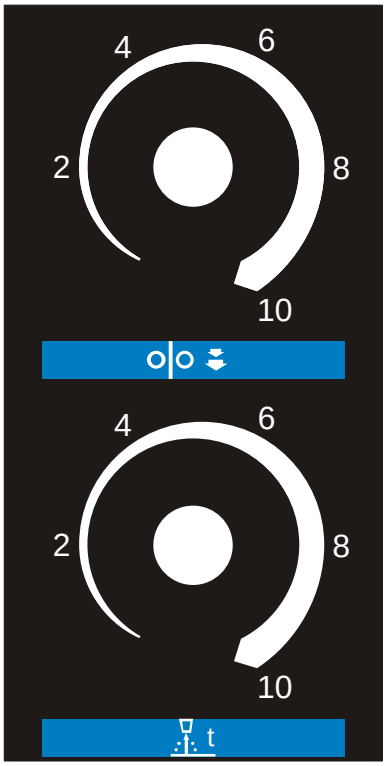
SECTION 4 − OPERATION

4-1. ST 44 Series Panel Controls



1 Voltage Control
2 Purge Control
3 Jog
4 2T−4T Switch
5 Power ON-OFF
6 Digital Voltmeter/mpm
7 Remote Control Receptacle
8 Flowmeter
9 In-Out Cooling System
10 Torch Connection
11 Panel/Remote Control Switch
12 Wire Speed Control
13 Circuit Breaker
14 Gas In Connector
15 Control Cable Connection
16 Weld Cable Connection
17 In-Out Cooling Connections

4-2. Run-In Control and Burnback Control



Run-In Control

Use control to set wire feed speed before arc initiation

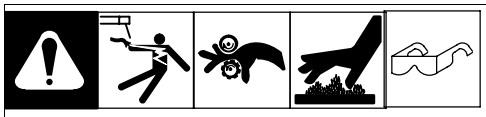
After arc initiation, wire feed speed is controlled by the wire feed speed control on the front control panel.

Burnback Control

Control adjusts the time welding wire is energized after wire feed stops.

SECTION 5 − MAINTENANCE & TROUBLESHOOTING

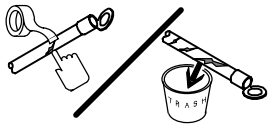
5-1. Routine Maintenance



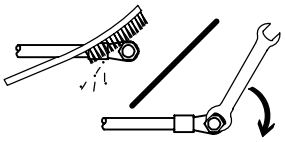
Disconnect power before maintaining.

3 Months

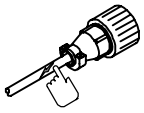
Replace Unreadable Labels



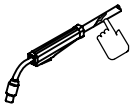
Repair Or Replace Cracked Weld Cable



Clean And Tighten Weld Terminals



14-Pin Cord

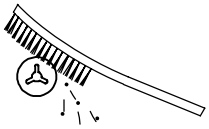


Gun Cable

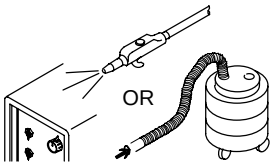
Gas Hose

Replace Cracked Parts

6 Months



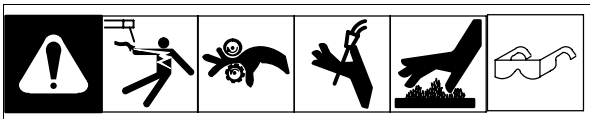
Clean Drive Rolls



OR

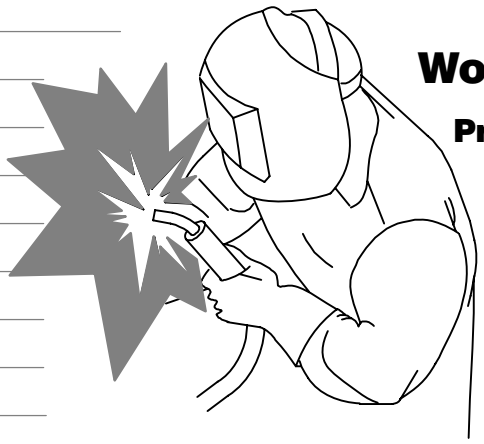
Blow Out Or Vacuum Inside, During Heavy Service, Clean Monthly

5-2. Troubleshooting



Problem	Solution
Unit is completely inoperative.	Check continuity of Power switch S1, and replace if necessary.
	Reset circuit breaker CB1 if open.
	Check input power source. See welding power source Technical Manual.
Wire does not feed, unit completely inoperative.	Turn Power switch On.
	Check 14−pin receptacle connections.
	Check input power or the CB
Wire does not feed.	Check gun trigger connection at wire feeder. Check gun trigger leads and trigger switch. See gun Owner's Manual.
	Have Factory Authorized Service Agent check drive motor and control board PC1.
Wire feeds erratically.	Readjust hub tension and drive roll pressure.
	Use correct size drive roll (see Parts List).
	Clean or replace dirty or worn drive roll.
	Remove weld spatter around nozzle opening.
	Replace contact tip or liner. See gun Owner's Manual.
	Have Factory Authorized Service Agent check drive motor and control board PC1.
Wire feeds when Jog switch is pressed but not when gun trigger is pressed.	Check gun trigger connection at wire feeder. Check gun trigger leads and trigger switch. See gun Owner's Manual.
Wire does not feed with Jog button S2B pressed.	Check continuity of Jog button S3, and replace if necessary.
	Check motor control board PC1 and connections, and replace if necessary
Electrode wire feeding stops or feeds erratically during welding.	Realign drive rolls.
	Check hub assembly (see Parts List).
Wire feeds as soon as power is applied.	Check gun trigger. See gun Owner's Manual.
Wire does not feed until trigger is pressed but continues to feed after trigger is released.	Check for short between gun trigger leads and weld cable. Repair or replace gun trigger leads.
Gas valve rattles loudly and wire feeds slowly or erratically.	Check for short between gun trigger leads and weld cable. Repair or replace gun trigger leads.
Gas does not flow; wire feeds.	Check gas valve and flowmeter.
Wire feeds, but gas does not flow with gun trigger pressed.	Check coil voltage and connections of gas valve GS1. Check continuity of coil. Replace GS1 if necessary.
	Check continuity of Purge switch S2A, and replace if necessary.
Wire feeds, but gas does not flow with Purge switch S2 pressed.	Check continuity of Purge switch S2A, and replace if necessary.
	Check coil voltage and connections of gas valve GS1. Check continuity of coil. Replace GS1 if necessary.
Wire feeds and electrode wire is energized, but gas flow is irregular.	Check coil voltage and connections of gas valve GS1. Check continuity of coil. Replace GS1 if necessary.
	Clear blockage in gas hose or replace hose.
	Clear blockage in gun. See gun Owner's Manual.
Motor runs at full speed.	Check motor control board PC1 and connections, and replace if necessary.
	Check resistance and connections of active wire speed potentiometers and replace if necessary.
Wire drive motor coasts (no brake at trigger release).	Check motor control board PC1 and connections, and replace if necessary.
Meter does not work properly.	Check optional meter board PC2 and connections, and replace if necessary

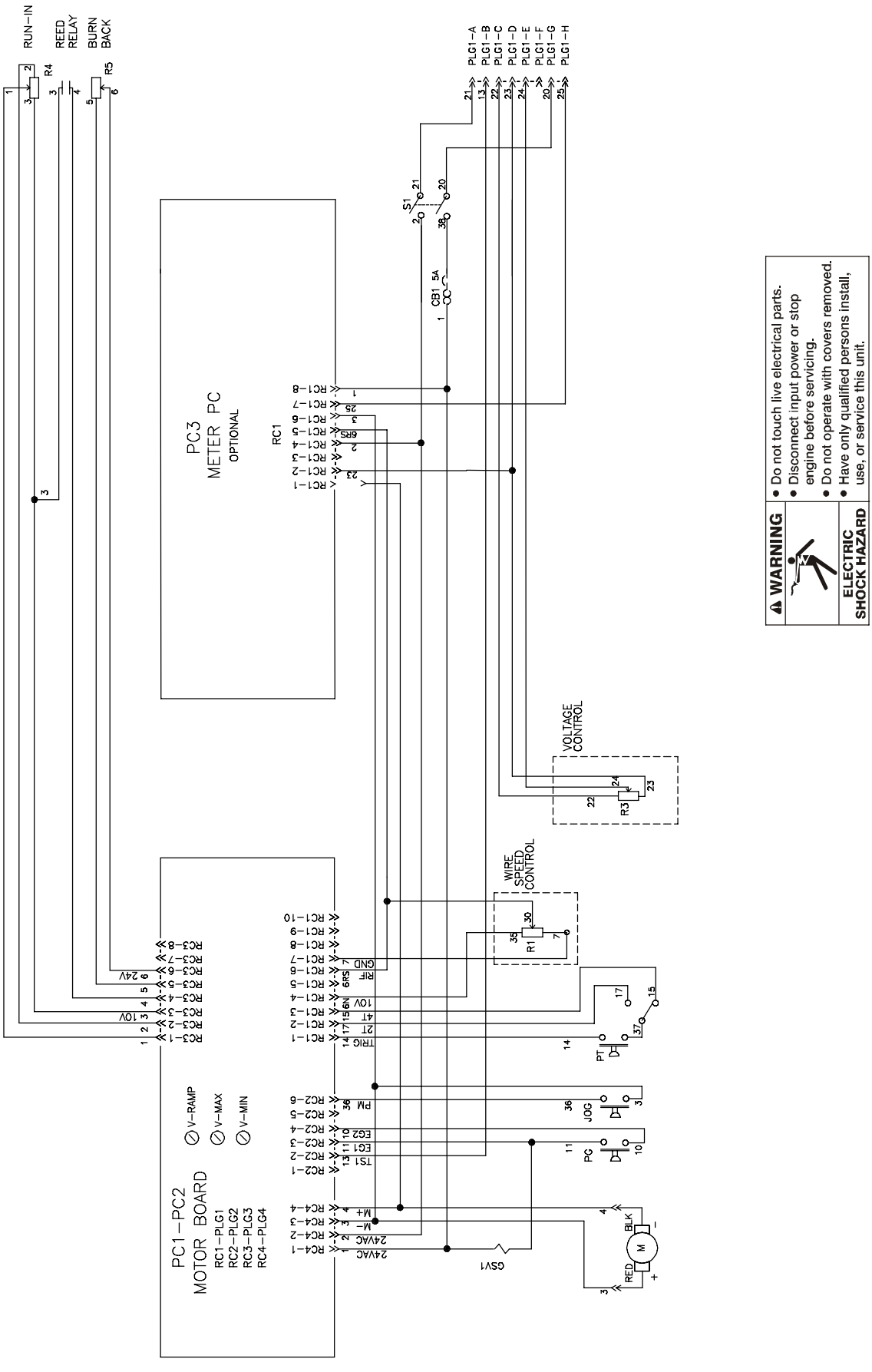
Notes



Work like a Pro!

Pros weld and cut safely. Read the safety rules at the beginning of this manual.

SECTION 6 − ELECTRICAL DIAGRAM



⚠ WARNING

ELECTRIC SHOCK HAZARD

- Do not touch live electrical parts.
- Disconnect input power or stop engine before servicing.
- Do not operate with covers removed.
- Have only qualified persons install, use, or service this unit.

956.142.484

☞ *Hardware is common and not available unless listed*

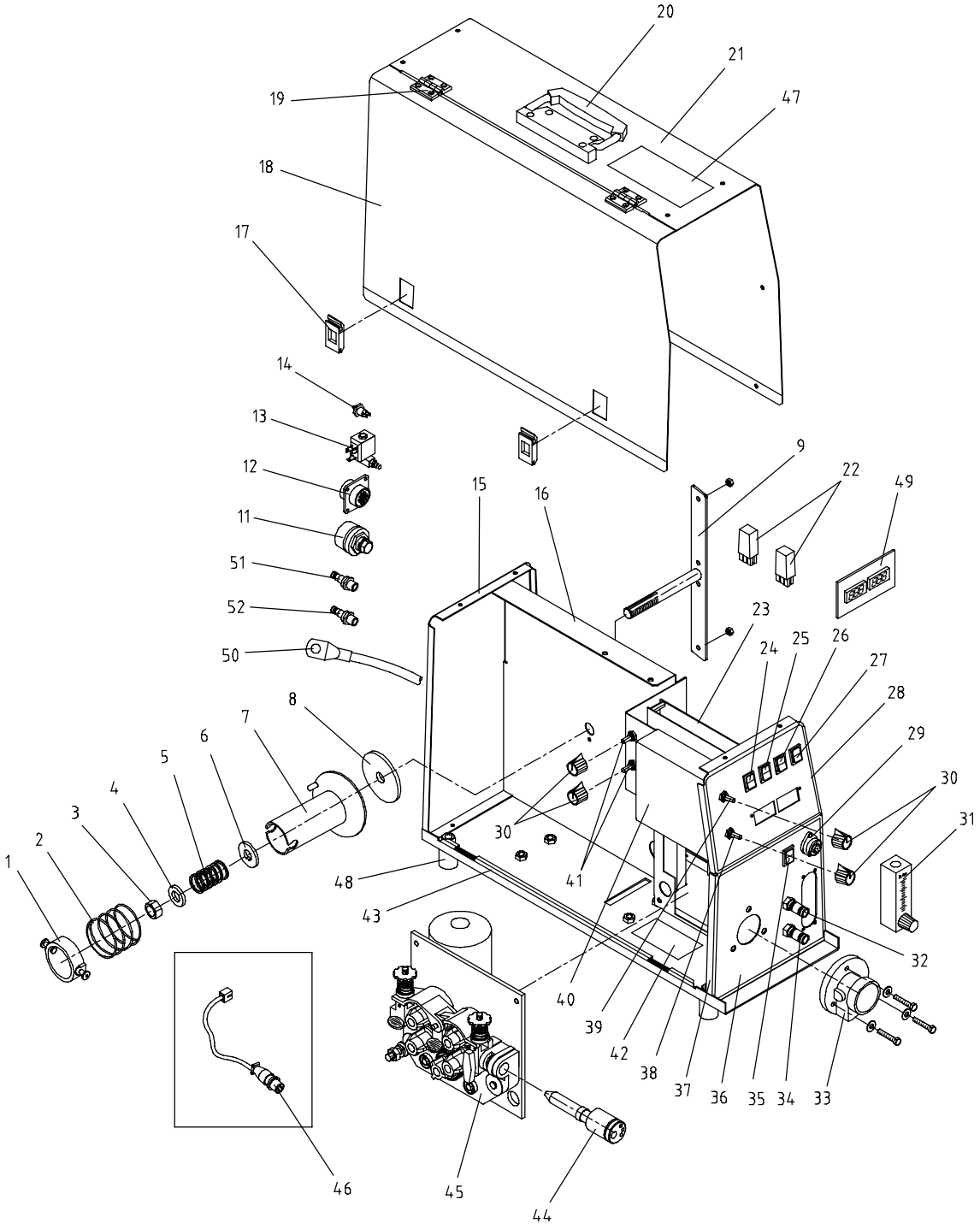


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Figure 7-1. ST 44 Complete Assembly (Optional Equipment Shown)

Item No.	Dia. Mkgs.	Part No.	Description	Qty	Basic	Digital	Ultra−Lite

Figure 7−1. ST 44 Complete Assembly

1		000058427	Ring	1	1		1
2		156032128	Spring	1	1		1
3		156018033	Nut	1	1		1
4		156009079	Washer	1	1		1
5		156032064	Spring	1	1		1
6		156009075	Washer, flat	1	1		1
7		000186435	Hub	1	1		1
8		000186436	Washer, plastic	1	1		1
9		156005108	Support, spool	1	1		1
11		056076216	Dinze Connector	1	1		1
12		056076192	14 Pin Panel Mounted Receptacle	1	1		1
13		056061042	Solenoid Valve, 24VAC	1	1		1
14		056067188	Circuit Breaker, 5 A	1	1		1
15		116118168	Rear Panel, steel	1	1		
15		116118170	Rear Panel, aluminium				1
16		117060014	Baffle Plate, centre	1	1		1
17		156034005	Latch	2	2		2
18		116122319	Side Panel, steel	1	1		
18		116122320	Side Panel, aluminium				1
19		156034004	Hinge, Polycarbonate	2	2		2
20		000208015	Handle	1	1		1
21		+156121022	Cover, steel	1	1		
21		+116121127	Cover, aluminium				1
22		000006393	Relay	2	2		2
23		057084124	Circuit Card, control board	1	1		1
24		056093022	Switch, gas purge	1	1		1
25		056093022	Switch, wire jog	1	1		1
26		056067169	Switch, 2T 4T trigger latch	1	1		1
27		056067194	Switch, power on/off	1	1		1
28		316029689	Name Plate, upper polycarbonate	1	1		1
29		056076180	Receptacle, 7 pin				
30		000207076	Knob, pointer	3	4		4
31		058016019	Flowmeter, gas				1
32		556049369	Quick Connector, water, blue			1	1
33		*756005024	Flange, euro adapter	1	1		1
34		556049368	Quick Connector, water, red			1	1
35		**056067169	Switch, remote				
36		316029691	Name Plate, lower polycarbonate	1	1		
37		316029690	Name Plate, lower polycarbonate, w/flowmeter				1
38		056059182	Potentiometer, voltage control	1	1		
39		056059182	Potentiometer, wire speed control	1	1		1
40		116005324	Motor Support, steel	1	1		
40		116005325	Motor Support, aluminium				1
41		056059277	Potentiometer 10.0k ohm	2	2		2
42		+178-937A	Label, electric chock and pinch	1	1		1
43		+116006130	Base, steel	1	1		
43		+116006131	Base, aluminium				1
44		*V57052030	Euro torch adapter	1	1		1
45		Fig 7-2	Wire Drive Assembly	1	1		1
46		057028067	US torch plug connection				
47		+S178-936	Label, general precautionary	1	1		1
48		656110012	Foot, rubber	4	4		4
49		057095012	Circuit Card, digital meter board			1	1
50		027112275	Weld cable, w/lugs	1	1		1
51		000204326	Box, consummable	1	1		

+ When ordering a component originally displaying a precautionary label, the label should also be ordered.
* Euro torch models only.
** Optional

☞ *Hardware is common and not available unless listed*

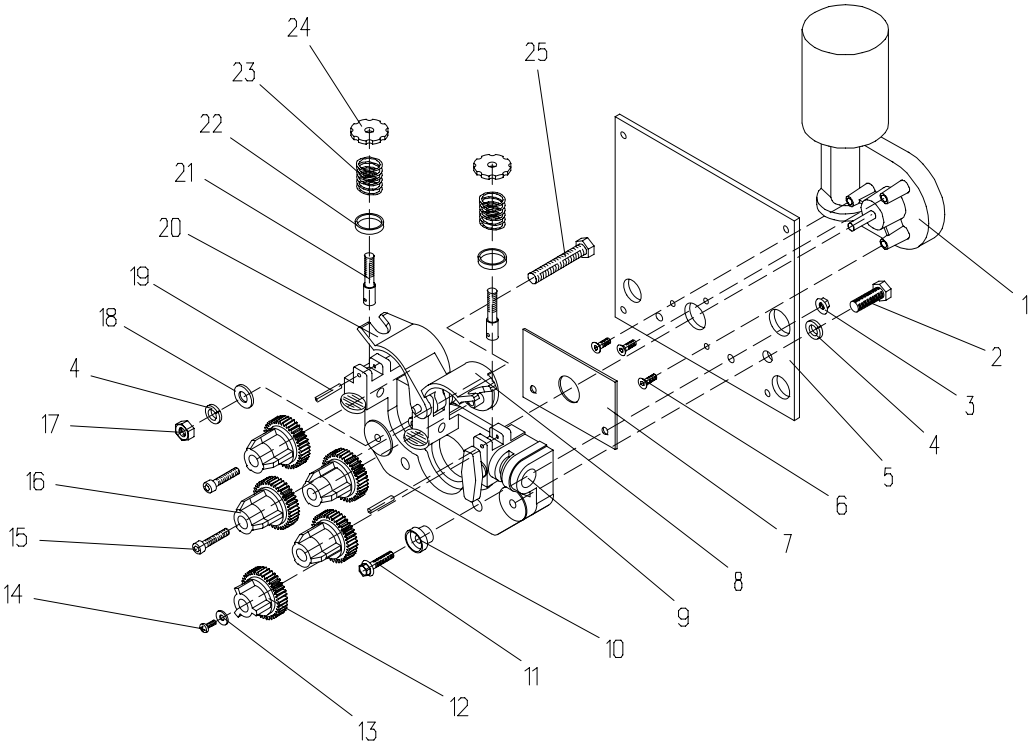

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Figure 7-2. 4 Roll Wire Drive Assembly (All Models)

Item No.	Dia. Mkgs.	Part No.	Description	Qty

Figure 7-2. 4 Roll Wire Drive Assembly (All Models)

... 1		057010051 ..	Drive Motor, 24 VDC, 100w	1
... 2		601 966 ..	Screw, housing	1
... 3			Nut	2
... 4		602 213 ..	Washer, locking	2
... 5		656005026 ..	Insulator, bulkhead	1
... 6		604 673 ..	Screw, hex c/sunk	4
... 7		187 325 ..	Insulator, drive assembly	1
... 8		166 338 ..	Lever, mounting pressure gear	1
... 9		166 337 ..	Housing, adapter gun/feeder	1
... 10		072 010 ..	Washer, insulated	2
... 11		108 943 ..	Bolt, adapter housing	2
... 12		173 618 ..	Drive Gear, central	2
... 13		602 239 ..	Washer, central drive gear/shaft	1
... 14		174 609 ..	Screw, central drive gear/shaft	1
... 15		602 009 ..	Screw, soc head hex	4
... 16		172 075 ..	Carrier, drive roll w/component 24 pitch	4
... 17		601 872 ..	Nut, power stud	1
... 18		602 213 ..	Washer, plain, power stud	1
... 19		010 224 ..	Pin, tension arm	2
... 20		166 071 ..	Lever, mtg pressure gear	1
... 21		089 562 ..	Tension arm, pinned	2
... 22		085 244 ..	Washer, cupped steel	2
... 23		089 477 ..	Spring, tension arm	2
... 24		089 243 ..	Knob, adjustment tension	2
... 25		202 562 ..	Power stud	1

Table 7-1. Drive Roll And Wire Guide Kits (4 Drive Roll)

☞ *Base selection of drive rolls upon the following recommended usages:*

1. *V-Grooved rolls for hard wire.*
2. *U-Grooved rolls for soft and soft shelled cored wires.*
3. *U-Cogged rolls for extremely soft shelled wires (usually hard surfacing types).*
4. *V-Knurled rolls for hard shelled cored wires.*
5. *Drive roll types may be mixed to suit particular requirements (example: V-Knurled roll in combination with U-Grooved).*

Wire Diameter			Kit No.	Drive Roll		Wire Guide	
Metric	Fraction	Decimal		Part No.	Type	Inlet	Intermediate
0.6 mm	0.023/0.025 in	0.023/0.025 in	087 132	087 130	V-Grooved	056 192	056 206
0.8 mm	0.030 in	0.030 in	046 780	053 695	V-Grooved	056 192	056 206
0.9 mm	0.035 in	0.035 in	046 781	053 700	V-Grooved	056 192	056 206
1.0/1.2 mm	0.035/0.045 in	0.035/0.045 in	N/A	189 285	V-Grooved	156 193	056 207
1.0 mm	0.040 in	0.040 in	191 917	053 696	V-Grooved	056 192	056 206
1.2 mm	0.045 in	0.045 in	046 782	053 697	V-Grooved	056 193	056 207
1.6 mm	1/16 in	0.062 in	046 784	053 699	V-Grooved	056 195	056 209
0.9 mm	0.035 in	0.035 in	044 750	072 000	U-Grooved	056 192	056 206
1.2 mm	0.045 in	0.045 in	046 785	053 701	U-Grooved	056 193	056 207
1.3 mm	0.052 in	0.052 in	046 786	053 702	U-Grooved	056 193	056 207
1.6 mm	1/16 in	0.062 in	046 787	053 706	U-Grooved	056 195	056 209
2.0 mm	5/64 in	0.079 in	046 788	053 704	U-Grooved	056 195	056 209
0.9 mm	0.035 in	0.035 in	046 782	132 958	V-Knurled	056 192	056 206
1.2 mm	0.045 in	0.045 in	046 793	132 957	V-Knurled	056 193	056 207
1.3 mm	0.052 in	0.052 in	046 794	132 956	V-Knurled	056 193	056 207
1.6 mm	1/16 in	0.062 in	046 795	132 955	V-Knurled	056 195	056 209
1.8 mm	0.068-0.072 in	0.068-0.072 in	089 985	132 959	V-Knurled	056 195	056 209
2.0 mm	5/64 in	0.079 in	046 796	132 960	V-Knurled	056 195	056 209
1.2 mm	0.045 in	0.045 in	083 319	083 489	U-Cogged	056 193	056 207
1.3 mm	0.052 in	0.052 in	083 320	083 490	U-Cogged	056 193	056 207
1.6 mm	1/16 in	0.062 in	046 800	053 708	U-Cogged	056 195	056 209
2.0 mm	5/64 in	0.079 in	046 801	053 710	U-Cogged	056 195	056 209

Notes

Notes

Notes

TRUE BLUE® WARRANTY

Effective January 1, 2009

This limited warranty supersedes all previous Miller warranties and is exclusive with no other guarantees or warranties expressed or implied.

LIMITED WARRANTY − Subject to the terms and conditions below, ITW Welding Products Italy warrants to its original retail purchaser that new Miller equipment sold after the effective date of this limited warranty is free of defects in material and workmanship at the time it is shipped by Miller. THIS WARRANTY IS EXPRESSLY IN LIEU OF ALL OTHER WARRANTIES, EXPRESS OR IMPLIED, INCLUDING THE WARRANTIES OF MERCHANTABILITY AND FITNESS.

Within the warranty periods listed below, Miller will repair or replace any warranted parts or components that fail due to such defects in material or workmanship. Miller must be notified in writing within thirty (30) days of such defect or failure, at which time Miller will provide instructions on the warranty claim procedures to be followed.

Miller shall honor warranty claims on warranted equipment listed below in the event of such a failure within the warranty time periods. All warranty time periods start on the date the equipment was delivered to the original retail purchaser, not to exceed eighteen months after the equipment is shipped to an International distributor.

1. 5 Years Parts — 3 Years Labor
   * Original main power rectifiers limited to only include SCRs, diodes, and discrete rectifier components where applicable
   * Inverters (Input and Output Rectifiers Only)
2. 3 Years — Parts and Labor
   * Transformer/Rectifier Power Sources
   * Plasma Arc Cutting Power Sources
   * Semi-Automatic and Automatic Wire Feeders
   * Inverter Power Sources (Unless Otherwise Stated)
   * Water Coolant Systems (Integrated)
   * Engine Driven Welding Generators **(NOTE: Engines are warranted separately by the engine manufacturer.)**
3. 2 Years — Parts and Labor
   * Motor Driven Guns (w/exception of Spoolmate Spoolguns)
   * Process Controllers
   * RFCS Foot Controls
   * IHPS Power Sources and Coolers
   * Water Coolant Systems (Non-Integrated)
   * HF Units
   * Running Gear/Trailers
   * Field Options (NOTE: Field options are covered under True Blue® for the remaining warranty period of the product they are installed in, or for a minimum of one year — whichever is greater.)
4. 1 Year — Parts and Labor Unless Specified
   * DC 253 & 403 Rectifier (April 06>)
   * Migmatic 171 (April 06>)
5. 6 Months — Batteries
6. 90 Days — Parts
   * MIG Guns
   * Induction Heating Coils and Blankets
   * Remote Controls
   * Accessory (Kits)
   * Replacement Parts (No labor)
   * Spoolmate Spoolguns
   * Canvas Covers

Miller's True Blue® Limited Warranty shall not apply to:

1. **Consumable components; such as contact tips, cutting nozzles, contactors, brushes, slip rings, relays or parts that fail due to normal wear.**
2. Items furnished by Miller, but manufactured by others, such as engines or trade accessories. These items are covered by the manufacturer's warranty, if any.
3. Equipment that has been modified by any party other than Miller, or equipment that has been improperly installed, improperly operated or misused based upon industry standards, or equipment which has not had reasonable and necessary maintenance, or equipment which has been used for operation outside of the specifications for the equipment.

MILLER PRODUCTS ARE INTENDED FOR PURCHASE AND USE BY COMMERCIAL/INDUSTRIAL USERS AND PERSONS TRAINED AND EXPERIENCED IN THE USE AND MAINTENANCE OF WELDING EQUIPMENT.

In the event of a warranty claim covered by this warranty, the exclusive remedies shall be, at Miller's option: (1) repair; or (2) replacement; or, where authorized in writing by Miller in appropriate cases, (3) the reasonable cost of repair or replacement at an authorized Miller service station; or (4) payment of or credit for the purchase price (less reasonable depreciation based upon actual use) upon return of the goods at customer's risk and expense. Miller's option of repair or replacement will be F.O.B., Factory at ITW Welding Products Group Europe or F.O.B. at a Miller authorized service facility as determined by Miller. Therefore no compensation or reimbursement for transportation costs of any kind will be allowed.

TO THE EXTENT PERMITTED BY LAW, THE REMEDIES PROVIDED HEREIN ARE THE SOLE AND EXCLUSIVE REMEDIES. IN NO EVENT SHALL MILLER BE LIABLE FOR DIRECT, INDIRECT, SPECIAL, INCIDENTAL OR CONSEQUENTIAL DAMAGES (INCLUDING LOSS OF PROFIT), WHETHER BASED ON CONTRACT, TORT OR ANY OTHER LEGAL THEORY.

ANY EXPRESS WARRANTY NOT PROVIDED HEREIN AND ANY IMPLIED WARRANTY, GUARANTY OR REPRESENTATION AS TO PERFORMANCE, AND ANY REMEDY FOR BREACH OF CONTRACT TORT OR ANY OTHER LEGAL THEORY WHICH, BUT FOR THIS PROVISION, MIGHT ARISE BY IMPLICATION, OPERATION OF LAW, CUSTOM OF TRADE OR COURSE OF DEALING, INCLUDING ANY IMPLIED WARRANTY OF MERCHANTABILITY OR FITNESS FOR PARTICULAR PURPOSE, WITH RESPECT TO ANY AND ALL EQUIPMENT FURNISHED BY MILLER IS EXCLUDED AND DISCLAIMED BY MILLER.

Miller®

Owner’s Record

Please complete and retain with your personal records.

Model Name Serial/Style Number

Purchase Date (Date which equipment was delivered to original customer.)

Distributor

Address

Country Zip/Postal Code

For Service

Contact a DISTRIBUTOR or SERVICE AGENCY near you.

Always provide Model Name and Serial/Style Number.

Contact your Distributor for:

- Welding Supplies and Consumables
- Options and Accessories
- Service and Repair
- Replacement Parts
- Owner’s Manuals

Contact the Delivering Carrier to:

File a claim for loss or damage during shipment.

For assistance in filing or settling claims, contact your distributor and/or equipment manufacturer’s Transportation Department.

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